

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES  
(Attorney Docket № 15474US01)

In the Application of:

Manoj Kumar Singhal

Serial № 10/803,420

Filed: March 18, 2004

For: SYSTEM AND METHOD FOR TIME  
DOMAIN AUDIO SPEED UP, WHILE  
MAINTAINING PITCH

Examiner: COLUCCI, MICHAEL C

Group Art Unit: 2626

Confirmation № 5543

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REPLY BRIEF

MS: APPEAL BRIEF-PATENTS  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with 37 CFR 41.41, the Appellant submits this Reply Brief in response to the Examiner's Answer mailed on February 1, 2010, with a two-month period of reply expiring on April 1, 2010. Claims 1-18 are pending in the present Application. The Appellant has responded to the Examiner in the Examiner's Answer, as found in the following Argument section.

As may be verified in his Final Office Action dated June 4, 2009 ("Final Office Action"), the Examiner had previously rejected all pending claims 1-18.

Claims 1, 4-6, 9-11 and 14-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,781,696, by Oh et al. ("Oh"), in view of U.S. Patent No. 6,915,263, by Chen et al. ("Chen"). See Final Office Action at pages 4-9.

Claims 2-3, 7-8 and 12-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,781,696, by Oh et al. ("Oh"), in view of U.S. Patent No. 6,915,263, by Chen et al. ("Chen"), and further in view of U.S. Patent No. 5,684,829, by Kizuki et al. ("Kizuki"). See Final Office Action at pages 9-11.

To aid the Board in identifying corresponding arguments, the Appellant has used the same headings in the Argument section of this Reply Brief as the headings found in the Appellant's corresponding Brief on Appeal. The Brief on Appeal has a date of deposit of November 4, 2009.

#### **STATUS OF THE CLAIMS**

Claims 1-18 were finally rejected in the Final Office Action mailed June 4, 2009. Pending claims 1-18 are the subject of this appeal.

## ARGUMENT

The Appellant respectfully traverses the rejections of claims 1-18 at least based on the following arguments made in the Brief on Appeal.

**I. The Proposed Combination of Oh and Chen Does Not Render Claims 1, 4-6, 9-11 and 14-18 Unpatentable**

The Appellant turns to the rejection of claims 1, 4-6, 9-11 and 14-18 as being unpatentable over Oh in view of Chen. The Appellant stands by the arguments made in the corresponding sections of the Brief on Appeal as set forth in further detail below.

**A. Rejection of Independent Claims 1, 6 and 11**

The Appellant stands by the arguments made in the corresponding section of the Brief on Appeal.

The Appellant initially notes that the Appellant's Brief on Appeal discusses the numerous reasons that Chen fails to remedy the deficiencies of Oh. In response to Appellant's Brief on Appeal, the Examiner first rehashes Oh's disclosure on Pages 12-14 of the Examiner's Answer. At Page 14, the Examiner's Answer states the following:

More importantly, **Chen has been introduced to render obvious at what point during an algorithm a windowing function should be applied.** For instance, as recited in the previous Final office action dated 06/04/2009, Examiner states that Oh fails to teach "Applying a window function to the remaining frames" (Final office action 06/04/2009 – page 5). Oh teaches the well known use of window function, **but Chen applies it AFTER the frames are skipped.**

...

Examiner does agree with Applicant with regard to muting being different from skipping frames. For instance, please consider that Oh explicitly teaches skipping speech segments as pointed out above. However Chen teaches that "muting" is a form of a window function (as is well known), that is "the output is muted" (Chen Col. 9 lines 9-39). Therefore, Oh's conventional playback concept via frame skipping is improved through the use of a window function of a frame. That is a frame is skipped (via Oh), and the output will be sent to a window function (i.e. muted via Chen). Examiner finds that Oh's variable speed capability is improved alone by Chen's window function (i.e. muting) *after* one or more frames are skipped according to a playback speed (via Oh).

(Examiner's Answer, Page 14, Lines 6-11 and Page 15, Lines 7-16 (emphasis added)).

However, the Appellant notes there are at least two problems with the Examiner's arguments set forth above.

First, as shown above, the Examiner's primary argument appears to be that "a frame is skipped (via Oh), and the output will be sent to a window function (i.e. muted via Chen)." However, if the remaining (i.e., non-skipped) frames in Oh were muted as taught by Chen, the played-back audio would be silence.

Oh teaches that "[w]ith this arrangement, it is possible to play back audio...at an adjusted speed while preventing degradation in tone color and loss of audio signals from occurring upon varying the play-back speed...so that the played-back audio sounds like a person speaking quickly or slowly." (Oh, Abstract). On the other hand, Chen "provides an audio decoder unit that merges nearby muted ("error")

frames to extend a silence period between the error frames when the error rate is high. By extending the silence period, a more natural and less annoying sound results when the bitstream includes many nearby errors. .... By extending the recovery period, **mutes are merged**, e.g., non-error frames are muted to **provide a longer mute duration**." (Chen, Column 2, Lines 54-63). Clearly, one of ordinary skill in the art would not mute all non-skipped frames (i.e., the remaining frames) as suggested by the Examiner's Answer in light of Oh's purpose of preventing degradation in tone color and loss of audio signals so that the played-back audio sounds like a person speaking quickly or slowly.

In fact, even Chen only mutes error frames or frames that are near error frames in order to provide a longer mute duration. (See e.g., Chen, Column 2, Lines 54-63). Chen does not teach muting all played back frames (i.e., the remaining frames) as alleged by the Examiner's Answer. Rather, Chen teaches that when the second error summation is not greater than the tolerance, the current frame is normally decoded and played. (See e.g., Chen, Column 9, Lines 9-13). Further, Chen only teaches applying its window function to soft mute frames. (See e.g., Chen, Figure 4 (345), Column 2, Lines 11-15 and Column 9, Lines 23-27). Thus, because Chen only applies its window function to a current frame to soft mute a current frame and does not mute all frames, Chen fails to remedy the deficiencies of Oh in that the combination of references clearly fails to teach "applying a window function to the remaining frames," as recited in Appellant's independent claims 1 and 6; and "the at least one controller configured to

apply a window function to the remaining frames," as recited in Appellant's independent claim 11.

Second, the Appellant notes that the Final Office Action alleged that Chen's disclosure of muting frames teaches skipping frames. (See *e.g.*, Final Office Action, Page 3, Line 1). However, as shown above, the Examiner now acknowledges that muting is different from skipping frames. Thus, as pointed out in the Appellant's Brief on Appeal, Chen fails to disclose skipping frames. As such, Chen cannot teach "[applying a window function] AFTER the frames are skipped" as alleged by the Examiner's Answer because no frames are skipped in Chen.

Further, even if Chen's muted frames could be considered skipped frames (which they clearly are not), the Appellant notes that Chen discloses applying the attenuation function or window to the current frame (i.e., error frame or frame to be muted) to soften the mute. For example, Chen discloses receiving a current frame; determining whether a first error sum is greater than zero for the current frame; if the first error sum is not greater than zero, performing a normal decode of the current frame; if the first error sum is greater than zero, determining whether a second error sum is greater than a tolerance value; if the second error sum is less than the tolerance value, performing a normal decode of the current frame; and **if the second error sum is greater than the tolerance level, muting the current frame by, for example, "apply[ing] a soft mute**

to the current frame" or applying a frame repeat process. (Chen, Figure 4 and Column 7, Line 9 through Column 10, Line 26 (emphasis added)).

With regard to applying a soft mute to the current frame, Chen discloses "an attenuation function or 'window' was applied to the error frame to soften the mute." (Chen, Column 2, Lines 14-15 (emphasis added)). Chen further discloses "a number of different muting operations can be performed to mute the current frame. In the preferred embodiment, a smooth muting with zeros can be applied to decline the audio signal at a given rate according to a window function..." (Chen, Column 9, Lines 23-27 (emphasis added)). The Appellant further notes that Chen's Figure 6 "illustrates an audio signal in accordance with a muted audio frame and a smoothing window function applied thereto." (Chen, Column 4, Lines 50-52 (emphasis added)).

As clearly shown above, Chen discloses applying its muting/attenuation/smoothing window function to frames that are to be muted. The Final Office Action acknowledges that Chen teaches applying a window function to zero or mute frames. (See e.g., Page 2, Line 21 – Page 3, Line 3). Thus, because Chen clearly discloses applying a window function to mute frames and the Final Office Action acknowledges that the window function is Chen is used to mute or zero frames, the Appellant notes that even if Chen's muted frames could be considered skipped frames (which they clearly are not), Chen's window function is not applied "AFTER the frames are skipped" (i.e., muted), as alleged by the Examiner's Answer. Rather, Chen applies its window function to mute the current frame.

Alternatively, if the Examiner's Answer is now alleging that Chen teaches skipping a current frame and then muting the remaining frames, the Appellant notes that the Examiner's Answer mischaracterizes Chen. Specifically, the Appellant references the Examiner's comment that "[e]ven though the language of Chen states 'the current frame is skipped and the output is muted' (Chen Col. 9 lines 9-39), this brief mention of frame skipping is not relevant to a playback speed." (Examiner's Answer, Page 12, Lines 13-15 (emphasis in original)). However, as one of ordinary skill in the art would readily understand from Chen's disclosure, Chen does not teach skipping a current frame and then muting the remaining frames.

For example, the full sentence referred to by the Examiner states that "[i]t is appreciated that if the second error summation is greater than the tolerance, then the current frame is skipped and the output is muted (whether or not the current frame contains an error therein), otherwise, the current frame is normally decoded and played." (Chen, Column 9, Lines 9-13). In other words, Chen teaches that a current frame is either played back muted or played back normally. Chen's previous paragraph supports such an interpretation when it states that "[i]f the second error sum is greater than the tolerance, then errors are found within the second error template 380 and at step 345 the current frame is muted (whether or not the current frame has an error therein). After muting, step 305 is entered to obtain and process the next frame. At step 340, the second error sum is not greater than the tolerance value and the normal



decode process is performed on the current frame with an applied recovery stage.” (Chen, Column 8, Line 62 – Column 9, Line 3).

Thus, although in the one instance cited by the Examiner Chen does refer to a muted frame as “skipped,” the Appellant notes that nowhere in Chen is there any disclosure regarding not playing back a frame. Therefore, the context of the term “skipped” used in the one instance in Chen is clearly different than the terms “skip” and “skipping” as defined in Appellant’s independent claims 1, 6 and 11. Further, Chen’s window function is not applied “AFTER the frames are skipped” (i.e., muted), as alleged by the Examiner’s Answer. Rather, Chen applies its window function to soft mute the current frame.

In addition to the cited section of the Examiner’s Answer above, the Examiner’s Answer further states that “[b]elow figures 6 of Chen is shown having a red box indicating where a left over frame is to have a window function applied.” (Examiner’s Answer, Page 15, Lines 17-18). However, the Appellant first notes, as discussed above, that all frames in Chen are “left over” because no frames are skipped. Further, Chen’s Figure 6 merely discloses “a muted audio frame and a smoothing window function applied thereto.” (Chen, Column 4, Lines 50-52). As noted above, applying a window function only to muted audio frames as taught by Chen is different than “applying a window function to the remaining frames,” as recited in Appellant’s independent claims 1 and 6; and “the at least one controller configured to apply a

window function to the remaining frames," as recited in Appellant's independent claim

11. Thus, Chen clearly fails to remedy the deficiencies of Oh.

Also, the Examiner's Answer states that "in figure 5B below, the frames enclosed with the dashed line are the frames that have a window function applied." (Examiner's Answer, Page 15, Lines 18-19). However, the frames enclosed with the dashed line 380 are not frames that have a window function applied as alleged by the Examiner's Answer. Rather, Chen teaches that dashed line 380 is a second error template that spans from the current frame (frame 48) and has a length determined by a length table, which in this case is five frames long and includes previous frames 44-47 in addition to the current frame 48. (Chen, Column 8, Lines 41-47). Chen further teaches that the summation of the error entries of the error array 370 for the frames of the second error template 380 (i.e., the dashed line) is used to compare to a tolerance amount to determine whether to mute the current frame 48. (Chen, Figure 5B, Column 8, Line 50 – Column 9, Line 3). The Appellant notes that Chen's teaching of muting frames individually (e.g., current frame 48) based in part on a summation of error entries in error array 370 for frames (i.e., frames 44-48) within an error template 380 (i.e., the dashed line) does not teach applying a window function to the frames enclosed within the dashed line 380 as alleged in the Examiner's Answer. Thus, the Appellant notes the repeated mischaracterization of Chen in the Examiner's Answer and Final Office Action.

Further, the Examiner's Answer states that "Figure 5B is essentially a frame representation of the speech signal in Figure 6." (Examiner's Answer, Page 15, Line 20). However, Figure 5B is not a frame representation of Figure 6 as alleged by the Examiner's Answer. Rather, Chen states that the audio signal of Figure 6 merely corresponds to a muted audio frame, not a plurality of frames as shown in Figure 5B. (See e.g., Chen, Column 4, Lines 50-52).

Additionally, the Examiner's Answer states that "figure 4 of the *present invention* (*Drawings*) below, shows a similar speech signal with portions skipped, wherein for example element 101 is will have frames skipped. That is, the frame(s) at this point in the audio signal is/are skipped." (Examiner's Answer, Page 16, Lines 1-3). However, as disclosed in Appellant's Specification, "Figure 4 illustrates a block diagram describing the encoding of an audio signal 101, in accordance with the MPEG-1, layer 3 standard." (Appellant's Specification, Page 8, Lines 28-30). In other words, Appellant's audio signal 101 illustrated in Appellant's Figure 4 does not "show[ ] a similar speech signal with portions skipped," as alleged in the Examiner's Answer. Rather, after encoding an audio signal (e.g., Appellant's Figure 4), the Appellant's independent claim 1, for example, recites "receiving the encoded original audio signal; retrieving frames...; skipping frames; applying a window function to the remaining frames; converting the signal...; and using the original frequency to playback the analog format signal." Thus,

the Appellant notes that the Examiner's Answer mischaracterizes the Appellant's disclosure.

In addition to the above, the Appellant notes that the Examiner's Answer at least fails to specifically address the Appellant's third and fourth arguments in the corresponding section of the Appellant's Brief on Appeal. (See e.g., Appellant's Brief on Appeal, Pages 13-14). Rather, the Examiner's Answer acknowledges that it only addresses select portions of Appellant's arguments on pages 10-13, 15 and 17 of the Brief on Appeal. (See e.g., Examiner's Answer, Page 11, Line 18 – Page 12, Line 2). As noted above, the Appellant stands by the arguments made in the corresponding section of the Brief on Appeal.

Basically, the combination of Oh and Chen fail to disclose, for example, at least the limitations of "skipping frames at a rate according to a desired playback speed... applying a window function to the remaining frames," as recited in Appellant's independent claims 1 and 6; and "the at least one controller configured to skip frames at a rate according to a desired playback speed... the at least one controller configured to apply a window function to the remaining frames," as recited in Appellant's independent claim 11. Rather, Oh merely discloses applying a window function to the audio characteristics component. Nowhere in Oh is there any disclosure regarding applying a window function to the speech source components not deleted by the speech

source modulating unit of the pitch modulating unit 4. Thus, as acknowledged by the Final Office Action, Oh fails to disclose "apply[ing] a window function to the remaining frames," as set forth in Appellant's independent claims 1, 6 and 11. Chen fails to remedy the deficiencies of Oh in that Chen merely discloses applying a window function to mute a current frame based on an error rate, which is different than "skip[ping] frames at a rate according to a desired playback speed...apply[ing] a window function to the remaining frames," as set forth in Appellant's independent claims 1, 6 and 11.

Therefore, the Appellant maintains that at least the limitations "skipping frames at a rate according to a desired playback speed... applying a window function to the remaining frames," as recited in Appellant's independent claims 1 and 6; and "the at least one controller configured to skip frames at a rate according to a desired playback speed... the at least one controller configured to apply a window function to the remaining frames," as recited in Appellant's independent claim 11, are not obvious over Oh in view of Chen. Accordingly, independent claims 1, 6 and 11 are not unpatentable over Oh in view of Chen and are allowable.

#### **B. Examiner's Response to Arguments**

The Appellant stands by the arguments made in the corresponding section of the Brief on Appeal.

The Appellant further notes that the Examiner's Answer at least fails to specifically address the Appellant's third and fourth arguments in the corresponding section of the Appellant's Brief on Appeal. (See *e.g.*, Appellant's Brief on Appeal, Pages 17-18). Rather, the Examiner's Answer acknowledges that it only addresses select portions of Appellant's arguments on pages 10-13, 15 and 17 of the Brief on Appeal. (See *e.g.*, Examiner's Answer, Page 11, Line 18 – Page 12, Line 2).

Accordingly, independent claims 1, 6 and 11 are not unpatentable over Oh in view of Chen and are allowable. Furthermore, the Appellant reserves the right to argue additional reasons beyond those set forth herein to support the allowability of claims 1, 6 and 11.

#### **C. Rejection of Dependent Claims 4-5, 9-10 and 14-15**

The Appellant stands by the arguments made in the corresponding section of the Brief on Appeal.

The Appellant further notes that the Examiner's Answer fails to address the Appellant's arguments in the corresponding section of the Appellant's Brief on Appeal. (See *e.g.*, Appellant's Brief on Appeal, Pages 19-20). Rather, the Examiner's Answer acknowledges that it only addresses select portions of Appellant's arguments on pages 10-13, 15 and 17 of the Brief on Appeal. (See *e.g.*, Examiner's Answer, Page 11, Line 18 – Page 12, Line 2).

Accordingly, the Appellant submits that claims 4-5, 9-10 and 14-15 are allowable over the combination of references cited in the Final Office Action at least for the reasons set forth in the corresponding section of the Brief on Appeal.

The Appellant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 4-5, 9-10 and 14-15.

#### **D. Rejection of Dependent Claims 16-18**

The Appellant stands by the arguments made in the corresponding section of the Brief on Appeal.

The Appellant further notes that the Examiner's Answer fails to address the Appellant's arguments in the corresponding section of the Appellant's Brief on Appeal. (See *e.g.*, Appellant's Brief on Appeal, Pages 20-21). Rather, the Examiner's Answer acknowledges that it only addresses select portions of Appellant's arguments on pages 10-13, 15 and 17 of the Brief on Appeal. (See *e.g.*, Examiner's Answer, Page 11, Line 18 – Page 12, Line 2).

Accordingly, the Appellant submits that claims 16, 17 and 18 are allowable over the combination of references cited in the Final Office Action at least for the reasons set forth in the corresponding section of the Brief on Appeal.

The Appellant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 16, 17 and 18.

**II. The Proposed Combination of Oh, Chen and Kizuki Does Not Render Claims 2-3, 7-8 and 12-13 Unpatentable**

The Appellant stands by the argument made in the corresponding section of the Brief on Appeal.

Accordingly, the Appellant submits that claims 2-3, 7-8 and 12-13 are allowable over the combination of references cited in the Final Office Action at least for the reasons set forth in the corresponding section of the Brief on Appeal. The Appellant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 2-3, 7-8 and 12-13.



**CONCLUSION**

The Appellant submits that the pending claims are allowable in all respects. Reversal of the Examiner's rejections for all the pending claims 1-18 and issuance of a patent on the Application are, therefore, requested from the Board.

The Commissioner is hereby authorized to charge additional fee(s) or credit overpayment(s) to the deposit account of McAndrews, Held & Malloy, Account № 13-0017.

Respectfully submitted,

Date: 31-MAR-2010

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